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IN THE

Supreme Court of the United States

OCTOBER TERM, 1970

No. 958

FEDERAL POWER COMMISSION,

Petitioner,

v.

FLORIDA POWER & LIGHT COMPANY,

Respondent.

ON WRIT OF CERTIORARI TO THE
UNITED STATES COURT OF APPEALS
FOR THE FIFTH CIRCUIT

BRIEF FOR THE RESPONDENT FLORIDA POWER & LIGHT COMPANY

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July, 1971

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PETITIONER'S STATEMENTS

The Brief of the Federal Power Commission adequately refers to the opinions below, the jurisdictional requisites, and the statutory provisions involved.

QUESTION PRESENTED

The Commission has asserted jurisdiction over Florida Power & Light Company ("FPL") as a "public utility" alleging that it operates facilities which transmit electric energy in interstate commerce. The Court of Appeals held

that the Commission had failed to carry its burden of proving "transmission of electric energy *in* interstate commerce" to or from the facilities of FPL. For the convenience of the Court the opinion below is attached as Exhibit A, paginated as in the Appendix.

FPL objects to the form of the Question Presented because it does not correctly reflect the jurisdictional requirements of the statute. Accordingly, FPL submits the following question as the one correctly here before this Court:

> "Whether the Court of Appeals correctly held that the Federal Power Commission failed to carry its burden to prove that there had been a 'transmission of electric energy *in* interstate commerce' to or from the facilities of Florida Power & Light Company so as to subject it to the Commission's regulatory jurisdiction."

STATEMENT

The Statement of the Commission is generally correct although argumentative in certain particulars, especially in its discussion and analysis of the connections of FPL with other electric companies. The Statement also omits certain facts which FPL deems relevant to a determination of the issue in this case, that is, whether or not FPL is a "public utility" subject to the jurisdiction of the Commission."[1]

A. The Business of Florida Power & Light Company

It should be kept in mind that FPL is basically in the distribution business. Although the exemption of the local

[1] The Federal Power Act defines a "public utility" as one owning or operating facilities used in "the transmission of electric energy in interstate commerce." (Section 201(e) of the Federal Power Act, 49 Stat. 847, 16 U.S.C. § 824). FPL in common parlance, is, of course, a public utility and is so recognized by the state regulatory agency, the Florida Public Service Commission.

distribution facilities from Commission jurisdiction is not involved in this case, virtually all of FPL's customers are also consumers. Of FPL's 931,400 customers mentioned by the Commission, all but 6 are retail sales. (App. 10). The 6 wholesale sales are to local cooperatives, and together account for less than 1% of FPL's revenues from sales of electric energy. FPL is not in the *business of buying and reselling* electric energy at either retail or wholesale, either intrastate or interstate.

As noted by the Commission, all of FPL's facilities lie wholly within the State of Florida, as do the facilities of all four electric systems with whom FPL has connections. Further, 75% of FPL's electric load is located at the extreme southern end of the peninsula between West Palm Beach and Miami, approximately 400 miles south of the Georgia border. (App. 74).

Because of the unique peninsular location of FPL's system and the frequency and severity of lightning storms and hurricanes, FPL has always designed and operated its system in such a way that it is not and will not be dependent upon others to supply any part of its predictable load. (App. 63, 71).

B. Electrical Terms and Systems

We believe it essential to this case that certain electrical terms and facts be understood. While there are certain phenomena of *electricity* that are not easily understood, there are certain facts and characteristics of the generation, transmission and use of *electric energy* which are accepted in the industry, and it is upon these that FPL relies.

Since the controlling issue in the case is whether "electric energy" is transmitted in interstate commerce, its defini-

tion is important. It is defined by the Commission as follows:

> "ENERGY—that which does or is capable of doing work. It is measured in terms of the work it is capable of doing; electric energy is usually *measured in kilowatt-hours.*"[2]

Electric energy is what all of us as householders pay for each month—so many kilowatt-hours as measured by a watt hour meter.

Since electric energy cannot be stored or accumulated in any kind of receptacle, a generator does not generate any more electric energy in any one moment of time than it is called upon to do so by the electric load to which it is supplying energy.

When one or more generators are supplying electric energy to a load in one direction through an electric circuit, there cannot be a flow of electric energy from other generators in the opposite direction through the same circuit.[3]

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[2] *Glossary of Important Power and Rate Terms, Abbreviations, and Units of Measurements* promulgated by the FPC in 1965 p. 6.

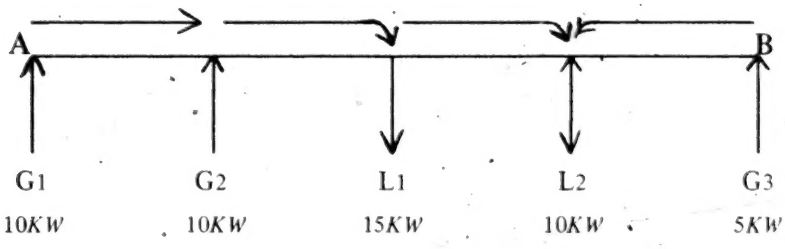
The following similar, but shorter definition is found in a publication of the Edison Electric Institute:

> *"ENERGY, ELECTRIC.* As commonly used in the electric utility industry, electric energy means kilowatt hours."

Glossary of Electric Utility Terms prepared by the Statistical Committee of the Edison Electric Institute, 750 Third Avenue, New York, New York, p. 32. Emphasis supplied throughout unless otherwise indicated.

[3] The Commission's expert witness agrees. App. 47, 48.

This fact is of considerable importance in this case and can be illustrated by the following diagram.



In the diagram, the line A-B is a three phase transmission line, the generators are indicated by "G", the loads by "L" and the size of the generators and loads are given below them. The arrows show the direction of flow of electric energy in the transmission line A-B. Of the twenty kilowatts produced by the generators G_1 and G_2, fifteen of it will be used by the load L_1 and the other five will go to the load L_2. The remaining five kilowatts needed for the ten-kilowatt load of L_2 comes from the generator G_3. None of the electric energy will flow from the generator G_3 to the load L_1. It will all be consumed within load L_2.

The Commission has made considerable reference to the fact that the generators in systems that have electrical connections between them are operated in synchronous operation (or "parallel operation"), meaning that the generators in the various systems all run at a speed which will give the same frequency. This is not something that must be sought —it cannot be avoided when systems have an interconnection. It is simply an electromechanical phenomenon inherently resulting from an interconnection of one electrical system with another. The mere existence of the connection

gives this result. Thus, in the diagram above, all the generators will naturally turn at the same speed.[4]

References to the "free-flowing" nature of electric energy may be misleading if not understood. Electric energy in a circuit is free-flowing in that it changes magnitude or direction in response to variations in loads or generator output, but it does *not* mean that in a given section of transmission line electric energy from one generator flows in one direction and simultaneously electric energy from another generator flows in another direction, or that the electric energy from any given generator can flow beyond the nearest load of size to consume the output of the generator. Referring back to the previous diagram, the free-flowing nature of electric energy will not permit the output of the generator G_3 to flow past the load L_2 so long as the output of the generator G_3 is less than the load L_2.[5]

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[4] App. 38, 39. We do not understand that the Commission denies that synchronous operation inherently results. This result is well recognized in various textbooks such as Langsdorf, *Theory of Alternating Current Machinery*, p. 519 (McGraw-Hill Book Company, Inc. 1955); Puchstein, Lloyd & Conrad, *Alternating Current Machines*, p. 536 (John Wiley & sons, Inc., New York, 1960).

[5] Other terms used by the court below or the Commission should be explained.

"Tie line" is simply the transmission line connecting two or more power systems. Comm. Ex. 29, App. 352. It is not anything that extends beyond a utility's system.

"Tie line control" means the control over the direction and magnitude of flow of electric energy in the Tie lines between a system and the adjacent systems to which its tie lines connect. This is usually done automatically in response to signals received from a telemetering (sensing) system which senses the magnitude and direction of electric energy flow in the tie lines and transmits that information to that particular company's electrical dispatch center.

"Tie line bias control" (sometimes erroneously called "tie line frequency control") is the frequency bias that is automatically set into the tie line control. "Frequency bias" means the amount of extra electric energy that a system is expected to supply to maintain frequency at 60 cycles during the time the load from a neighboring system tends to reduce generator speed.

C. The Florida Operating Committee

The facilities of all five participants of this Committee are wholly located within the state. However, one of the members, Florida Power Corporation ("Corp"), has connections at the Florida-Georgia state line with Georgia Power Company ("Georgia Power") located in that state with whom Corp buys and sells electric energy as part of its regular business.

The Florida Operating Committee interchanges energy among themselves for a limited purpose, as stated by the Examiner:

> The purpose of the energy interchanges is to take care of temporary needs. There are no economy sales (sales by a company that can produce lower cost power to a higher cost producer) because fuel costs are similar for all members. (App. 258).[6]

That is, the connections among the members of the Operating Committee do not exist so that these utilities may assist each other in meeting the anticipated load requirements, but only emergency or temporary needs. As noted by the Examiner, FPL's generating capacity is adequate to supply its own loads and was installed for that purpose. (App. 257).

This means that the Florida Operating Committee is not a "power pool", as the court below so stated (App. 371) and as the Commission recognizes in its Brief (Comm. Brief, p. 5, fn. 2).

FPL has no exchange arrangements with any electric system except the other four members of the Operating

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[6] Since all of the findings of fact made by the Presiding Examiner were approved by the Commission, no effort will be made here to distinguish between findings of the Examiner and findings of the Commission.

Committee. No company outside of Florida is obligated to supply any of FPL's needs—either emergency or normal. FPL is not obligated to serve any electric utility other than those four Florida systems with which it is directly connected, and only temporary and emergency needs of those systems, and then only if FPL has the excess power available. (App. 66, 68-71, 73-74).

The Commission's assertion of jurisdiction, and its attempt to prove interstate transmission of electric energy from or to FPL is based on the connection between Corp and Georgia Power. The interconnections between FPL and Corp are not a multitude of exchange points all along the systems of the two companies, but are at only two locations. One of these connections is between Corp's Turner Generating Plant and FPL's Sanford Substation near the town of Sanford, Florida about 180 miles south of the Georgia state line. The other connection is between Corp's Lake Wales Plant and FPL's Brevard Substation located near the town of Cocoa, Florida which is farther south than the Turner-Sanford connection.[7] Both the Commission and FPL offered evidence concerning the existence or not of interstate flows of electric energy at the Turner-Sanford connection, but none was offered with respect to the Lake Wales-Brevard connection. The Court of Appeals held there was no substantial evidence of any interstate transmission of electric energy through or over the facilities of FPL.

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[7] At one time, there existed a connection between Corp's Jasper Substation and FPL's Live Oak tap in the vicinity of White Springs, Florida. This was dismantled by removing a section of the line prior to commencement of hearings before the Examiner and is not involved in this case. R. 83. It was dismantled for engineering reasons discussed in the record. R. 225.

D. The Interconnected Systems Group

The Interconnected Systems Group ("ISG") described in the Commission's brief is a voluntary group of various electrical systems. (App. 37). FPL has no firm power contracts with it or any of its members to buy or sell electric energy. (App. 66). The ISG is not a power pool, and we do not understand the Commission to so contend.[8] FPL is a member of ISG simply because FPL is connected with Corp, and Corp in turn is connected with Georgia Power.

The Commission gives a quite erroneous impression when it describes the situation within the ISG as "All the electric energy produced by all of the generators of the members of ISG (or any interconnected network) is delivered to a common, integrated transmission grid of the network from which all the network's customers are served." (Comm. Brief, p. 8). This statement of the Commission is literally true if it is realized that what the Commission means is that the total amount of electric energy produced equals the total load. (App. 269). However, as the statement is worded, it might lead one to believe that there is a pool or reservoir of commingled electric energy into which all connected loads dip, or that all loads receive electric energy from all generators. Neither of these impressions is correct. With respect to the first, there is no way of storing electric energy, as the Commission admits. (Com. Brief, p. 8). With respect to the second, every load on an interconnected system cannot be supplied from all generators connected to that system.[9] Each generator (or plant with

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[8] Some of the systems within the ISG are parts of local or regional power pools, but the ISG itself is not a power pool.

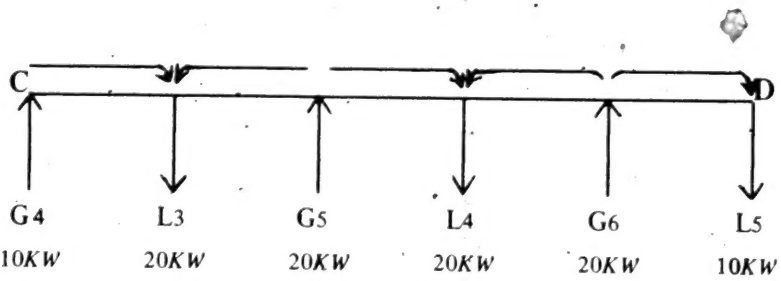
[9] As the Examiner pointed out, the distribution of electric energy in an electric network is determined by, among other things, the location and power outputs of the generating units in operation and the location and size of the electric loads. (App. 266).

several generators) will supply only the load in an area radiating outwardly from it. (R. 247). Electric energy from a generator cannot get past a load which is large enough to consume it.

Thus, a housewife turning on an electric light in Bismark, North Dakota, might have some theoretical effect upon a generator in FPL's system, but certainly no electric energy flows from a FPL generator to that housewife's lightbulb, and we do not understand the Commission to contend that it does. What occurs is what has been described rather accurately by the Examiner as "swapping and redistribution of loads" (App. 265) — a condition that occurs with all the various changes of load and generation size. This is the "cause and effect relationship" to which the Examiner referred. (App. 271).

The "effect" on a generator in FPL's system would exist because the total load on the ISG was changed, and at any time that total load changes there must be a change in total power generated from the whole system to keep generation and load in balance. However, whatever infinitesimal amount of extra energy that was necessary to be developed by the FPL generator would be consumed by the nearest load to that generator to which some other

generator had previously contributed electric energy. This is because of the "swapping" referred to by the Examiner. It is illustrated by the diagram below.



In the diagram, the line C-D is a transmission line and the arrows show the direction of flow of electric energy. If the load L_5 is increased, such as by turning on a light bulb, the additional energy that is required will be supplied by increased generation from the generator G_6 and from some of the electric energy that was going to L_4 from the generator G_6. This small amount of electric energy taken from L_4 will be "swapped" for more electric energy from the generator G_5. This in turn will reduce somewhat the energy supplied to load L_3 by the generator G_5 which will require the output of the generators G_4 and G_5 to increase somewhat to take on this swapped load.

E. The Electromagnetic Unity Theory

The theory upon which the Commission based its conclusion of jurisdictional transmission of electric energy over the facilities of FPL—"Electromagnetic unity"—does not involve any attempt to trace any interstate flow of electric energy into or out of FPL's system. Based on this theory,

the Examiner held, in a finding adopted by the Commission:

> ". . . that [FPL] transmits interstate electric energy. The conclusion is based on cause and effect relationships that are interstate in scope. No effort is made to trace the path of the interstate electric energy." (App. 271).

The effects described by the Commission in its brief—clocks keeping the same time, changes in loads affecting generation, etc.—are caused solely by the mere fact that systems are connected together and *is not caused by the interstate transmission of any electric energy.*

The Court of Appeals held that, standing alone, interconnection with electromagnetic unity is not substantial evidence of transmission of electric energy in interstate commerce over the facilities of FPL. (App. 364).

F. Tracing of Electric Energy

The alternative theory of proof submitted by the staff of the Commission involved attempting to trace electric energy flow to establish an actual transmission of electric energy in interstate commerce to or from FPL's facilities.

Studies of numerous days of electric energy flow were made by the staff in an attempt to show an interstate flow of electric energy, through the facilities of Corp and into the facilities of FPL at the Turner bus, which is owned by Corp and located at the interconnection between Corp and FPL in Sanford, Florida, some 180 miles south of the Georgia state line. The staff also attempted to establish a flow in the opposite direction from FPL's facilities, through the Turner bus, up through the various facilities of Corp and into the State of Georgia.

In its tracing studies, the Commission staff used the "commingled" method of tracing and FPL used the systems study method. The Examiner found:

> "On the basis of the commingled method, it can be proved that electric energy is transmitted between Florida [FPL] and Georgia [Georgia Power]; on the basis of the systems study method the contrary follows." (App. 272).

The difference between these studies thus becomes important.

The principal difference between the two methods involves the treatment of a bus. A bus is a set of three conductors used to electrically connect two or more sets of three lines. The lines may be either receiving electric energy from or transmitting electric energy through the bus. Most of the testimony related to the Turner bus which is essentially a heavy transmission line some 225 feet in length. At certain physically spaced points, which points are also distinct from the points at which electric energy is received, there are connections with lines which take electric energy from the bus and conduct it to various loads. (App. 94; R. 787A). For the Court's convenience, a simple diagram of the Turner bus taken from Exhibits 47 and 56 (App. 231; R. 1249) appears as an attachment hereto, Exhibit B. There are also various buses belonging to Corp between the Turner bus and the Georgia state line through which buses electric energy must flow if it is to go between the State of Georgia and FPL's system.

FPL treated these buses as simply short pieces of transmission line, which they are, and showed that because of the location of the various points of supply and loads on the buses, no electric energy reaching the Turner bus from out of state (if any did) would reach FPL's system because it would all be consumed by Corp's loads connected to

the Turner bus before it reached FPL's system. (App. 86, 87, 231). Likewise, it showed that electric energy from FPL reaching the Turner bus could not pass to Corp's one connection that might possibly lead out of state because it would also all be consumed by Corp's wholly intrastate loads connected to the Turner bus before it reached the possible interstate connection of Corp. (App. 90, 91, 92, 236, 237).[10]

To overcome their difficulty with the actual flow of energy, the staff chose to use the "commingled-in-a-bus" method which blithely ignores the reality that buses have considerable length and that connections are physically spaced along them. This "commingled-in-a-bus" theory treats a bus as simply a point with all connections into and out of the bus being at that point. Having done this, the Commission could then conclude that no matter where electric energy comes from that reaches this theoretically assumed point, some of it will go to each load connected to that bus.[11]

The Court of Appeals did not reverse this case simply because it preferred the tracing method of FPL to the "commingled-in-a-bus" method; it was not choosing between opposing but equally acceptable theories. The court below determined that the Commission had not met its burden of proving actual interstate transmission of electric energy when all it offered was a theory which has never been verified experimentally as fact (App.

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[10] The Commission brief, p. 6, refers to certain interstate flows between Corp and Georgia Power. These are quite insignificant compared to Corp's 4,715,973,800 kilowatt-hours generated by it during the same period of time. R. 1789.

[11] While the use or not of the commingled-in-a-bus method of tracing is of considerable importance in this case, in some situations the choice is irrelevant. For example, if all the generator connections are at one end of a bus and all the load connections are at the other end, then the electric energy flows in only one direction through the bus and the results of tracing are the same whether the systems study method or the commingled-in-a-bus method is used.

95), has never been approved by any court and is only "a simplified characterization of how, for various purposes of convenience, energy may be treated as flowing." (App. 368).

SUMMARY OF ARGUMENT

There must be transmission of electric energy in interstate commerce over FPL's facilities for FPL to be subject to the jurisdiction of the Commission. The Court of Appeals concluded that there was no substantial evidence to show certain or even probable transmission of electric energy across a state line to or from FPL. This conclusion is well supported by reason, principle and legal precedent.

The four Supreme Court cases[12] which have heretofore passed on the jurisdiction of the Commission over utilities under Part II of the Federal Power Act establish (a) a consistent requirement of proof of actual transmission across a state line and (b) an acceptable method of demonstrating such proof which involves measurement of energy flows.

It has been expressly held by this Court that interconnection at a bus with others across a state line does not *ipso facto* mean interstate transmission occurs.[13] It is not enough that certain "cause-and-effect" characteristics of interconnection may support a conclusion that interstate commerce is *affected* by interconnection, nor it is sufficient to say that interconnection *involves* interstate transmission. *Jersey Central* says clearly that beyond mere interconnec-

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[12] *Jersey Central Power & Light Co.* v. *FPC*, 319 U.S. 61 (1943) ("Jersey Central"); *Connecticut Light & Power Co.* v. *FPC*, 324 U.S. 515 (1945) ("Connecticut"); *Pennsylvania Water & Power Co.* v. FPC, 343 U.S. 414 (1952) ("Penn-Water"); *FPC* v. *Southern California Edison Co.*, 376 U.S. 205 (1964) ("City of Colton").

[13] *Jersey Central*, 319 U.S. at 65-66.

tion, there must be a showing of measurable electric energy flowing across state lines to or from the company sought to be regulated.

In order for the Commission's evidence in this case to be deemed sufficient and substantial proof of interstate transmission of electric energy, this Court must squarely overrule *Jersey Central.*

The Commission in its presentation emphasizes the complexities of the subject matter in an attempt to persuade the Court that the expertise of the Commission—regardless of the basis of its theories in this particular case—is inviolable. The subject matter is not so complex that the Commission—in the name of "expertise"—is entitled to ignore the statutory standard and substitute theoretical constructs for proof of interstate transmission of electric energy. Elevating a descriptive phrase like "electromagnetic unity of response" to a *theory of possible energy flow* does not prove the occurrence of the jurisdictional event.

As an alternative to its "electromagnetic unity" theory, the Commission attempted to trace flows of electric energy, but its "commingled-in-a-bus" method of tracing was disapproved in principle by this Court in *Jersey Central*, and its reason for existence was strongly rejected by the Commission itself in the *Connecticut* case.[14] The Examiner found that the method of measuring and tracing energy flow which was the basis for the decisions in *Jersey Central* and *City of Colton* cases, when applied to the present case, showed no interstate transmission of electric energy over the facilities of FPL.

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[14] *Connecticut Light & Power Co.*, 3 F.P.C. 132, 145 (1942); *Connecticut Light & Power Co.* v. *FPC*, 141 F.2d 14, 18 (D.C. Cir. 1944).

The Commission places some reliance on *Penn-Water*. In that case the Commission apparently used a "commingled" theory to establish interstate flows, but under the particular facts of the case the finding of interstate flows of energy would in all likelihood have been the result under the *Jersey Central* tracing method as well. In the *Penn-Water* case interstate transmission was not really contested, and the Court ruled against the utility primarily on the grounds that there were seasonal occurrences when every part of the utility's system was served for some period of time by such out-of-state electric energy.

The "commingled-in-a-bus" method of tracing was apparently not used in the "power pool" cases.[15] In those Court of Appeals cases the Commission made substantial efforts to prove large amounts of interstate electric energy in the particular "public utility's" system and in some situations showed by tracing that some if not all wholesale sales at some time received out-of-state energy. Under the particular facts of these cases — *and in the absence of any tracing evidence to the contrary* — jurisdiction over all such sales was held to be established by substantial evidence.

However, no such circumstances were shown here. Any inferences which might be otherwise justifiable based on the Corp-Georgia Power electric energy transmissions were rebutted by the evidence of actual tracing.

Based on the foregoing, FPL submits the Court of Appeals reached the correct conclusion.

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[15] *Indiana & Michigan Electric Co.* v. *FPC*, 365 F.2d 180 (7th Cir.), cert. denied, 385 U.S. 972 (1966); *Arkansas Power & Light Co.* v. *FPC*, 368 F.2d 376 (8th Cir. 1966); *Public Service Co. of Indiana* v. *FPC*, 375 F.2d 100 (7th Cir.), cert. denied, 387 U.S. 931 (1967); *Cincinnati Gas & Electric Co.* v. *FPC*, 376 F.2d 506 (6th Cir.), cert. denied, 389 U.S. 842 (1967).

No compelling reasons exist why FPL must now be subjected to the jurisdiction of the Commission. The connection between Corp and FPL upon which the Commision asserts jurisdiction has existed since 1942. When the connection was ordered as a wartime emergency measure, *the Commission informed FPL by letter (R. 202) that the interconnection "will not in and of itself bring Florida Power & Light Company within the jurisdiction of the Federal Power Commission."* This remained the Commission's position until 1965. No material fact or pertinent law has changed.

The court below stated the essence of what the Commission seeks as follows:

> "What the Commission virtually argues for in this case is extension of its jurisdiction to all electric companies *affecting* interstate commerce."

This is far in excess of the grounds for jurisdiction listed in Part II of the Federal Power Act.

FPL is essentially a distribution company dedicated to serving Florida consumers. It is independently fulfilling its responsibilities. Virtually all its sales are to the ultimate consumer at rates regulated by the Florida Public Service Commission. If there is a national interest which requires federal regulation of FPL, it is for Congress to declare such a policy, for none can be found in the Federal Power Act as presently enacted.

ARGUMENT

I. INTRODUCTION

The Court of Appeals found that the Commission had not met its burden of proving transmissions of electric energy in interstate commerce over the facilities of FPL.

The Commission urges that, as applied by the court below, the standard for proof of these facts is too difficult.

It says it is "unsatisfactory" to require it to "convince a court of scientific laymen that, in common-sense terms, some identifiable thing moves across states lines." Further it says, in effect admitting it did not prove actual transmissions by substantial evidence, that

> "It is not enough to say that the Commission must abstain until such time — if ever — as it can be proven as a 'fact' in common law terms that there is an 'actual' transmission."[16]

Yet the standard of which the Commission complains is simply the *statutory* burden — and limitation — placed on the Commission by Congress at a time when there existed the same technological problems, complexity of subject matter, and lay judges which the Commission today laments. As announced by this Court in the cases discussed hereafter, "transmission of electric energy in interstate commerce" means *actual* transmission across a state line.

Rather than resting its jurisdiction on "transmissions in interstate commerce," the Commission asserts for the first time that it can claim jurisdiction simply because FPL has transmissions *affecting* or *involving* interstate commerce. This position, although couched in technical-sounding language, is nevertheless contrary to the statute and the legislative history which plainly indicates Congress did not with this Act intend to regulate to the full extent of its powers under the Commerce Clause. U. S. Constitution, Article I, Section 8, Clause 3.

Congress apparently did not feel that there is something wrong with requiring an administrative agency to restrain its hand until it *proves* it is entitled to assert regulatory control, or that jurisdictional facts represent a mere technicality which may be cursorily treated. Quite apart from the limitations inherent in the state-federal relation-

[16] Comm. Brief, p. 36.

ship, the jurisdictional facts define the extent of the need as seen by Congress for federal regulation.

Finally, it should be pointed out that, although the Commission complains that the Fifth Circuit here substituted its judgment for that of the Commission, the opinion of the court below establishes clearly that the evidence in this case simply failed to come up to the statutory standard. Under these circumstances the court below was not required to blindfuly accept the Commission's conclusions in the name of "expertise."

II. THE EXISTING STANDARDS FOR DETERMINING INTERSTATE FLOW SHOW NO JURISDICTIONAL TRANSMISSION FROM OR TO FPL

As the court below points out, Part II of the Federal Power Act was enacted in 1935 in order to close the regulatory gap pointed out by this Court in *Public Utilities Commission of Rhode Island* v. *Attleboro Steam & Electric Co.*, 273 U.S. 83 (1927). Jurisdiction of the Commission under this Act has been considered by this Court on four occasions, two involving claims of jurisdiction based on interstate transmission of electric energy and two based on wholesale sales in interstate commerce.

These cases present the basic standard for determining Commission jurisdiction: actual interstate transmission of electric energy as demonstrated by measurement of such transmission.

The first and most important in terms of precedent for the present case is *Jersey Central Power & Light Co.* v. *FPC*, 319 U.S. 61 (1943). Here the company (Jersey Central) which the Commission asserted was a "public utility" was connected to an admittedly jurisdictional company (Public Service) by a two-mile line from Jersey

Central's South Amboy, New Jersey generating plant to a bus at Public Service's Mechanic Street Substation. The facilities of both these companies were located wholly within New Jersey. As described in the lower court opinion[17] the bus had seven connections in addition to the Jersey Central line. Five were to customers of Public Service in New Jersey, one to a Public Service substation in New Jersey, and the seventh was a line of a New York company (Staten Island).

Jersey Central and Public Service exchanged economy-flow electric energy,[18] as well as emergency energy. However, the quantity Jersey Central transmitted to Public Service far exceeded the deliveries returned. Public Service also had exchange agreements for economy-flow with Staten Island. All energy involved was transmitted in three-phase alternating current.

This Court held that since the bus had several connections and received energy from sources other than Jersey Central, the connection of the bus with Staten Island together with emergency transfers of electricity did "not prove conclusively that energy generated by Jersey Central passes to and is consumed in New York." (319 U.S. at 65).

This Court also carefully pointed out:

> ". . . Commission power does not extend over all connecting transmitting facilities but only over those

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[17] *Jersey Central Power & Light Co.* v. *FPC*, 129 F.2d 183, 186 (3rd Cir. 1942).

[18] "Economy-flow electricity may be described as energy generated and supplied by one company to another when the receiving company has enough generating facilities to generate that electricity for itself but elects to receive it from another company because that company can generate and deliver it to the point where it is needed more cheaply than the purchasing corporation." Ibid, 129 F.2d at 186.

> which transmit energy actually moving in interstate commerce. *Mere connection determines nothing.*" (319 U.S. at 72).

However, the Commission demonstrated actual interstate transmission by showing numerous instances based on *meter readings,*

> ". . . when *all* the energy flowing into the bus bar at Mechanic Street came from Jersey Central and at the same moments energy flowed from Mechanic Street in New Jersey to the Atlantic substation in New York. As no pools of energy exist from which the flow to New York could have been drawn, it necessarily follows that Jersey Central production was instantaneously transmited to New York." 319 U.S. at 66.

This Court held that this *actual* interstate transmission as measured and traced established the jurisdictional authority over Jersey Central.

Applying the principles of that case to FPL, Corp and Georgia Power, it is easy to see that the Commission has proved only the bare fact that both FPL and Georgia Power have connections with Corp — but not the same connection. At the Turner bus, where FPL connects with Corp, no evidence was forthcoming of even one occasion when electric energy from Georgia Power ever came through Corp's system and then went to FPL's connection on the Turner bus.

To the contrary, using the same method of measurement and tracing employed and approved in *Jersey Central,* FPL's witnesses showed and the Examiner agreed that there was no interstate flow into or out of FPL's system. On the occasions considered by the Commission to prove its case, all FPL energy transmitted to Corp was consumed by Corp's loads before it *could* have reached a line

carrying energy to Georgia Power and all energy received by Corp from Georgia Power would likewise have been consumed in the Corp system before it *could* have reached FPL's line to the Turner bus, 180 miles away from the Georgia-Florida state line where all energy transfers between Corp and Georgia Power take place.[19]

The other transmission status case of this Court is *Connecticut Light & Power Co.* v. *FPC*, 324 U.S. 515 (1945), where as reviewed by this Court there was no real dispute that there were interstate flows. As pointed out by the lower court,

> "Since actual meter readings in this case show such an interstate flow of current to supply petitioner's facilities, it is a public utility under the Act."[20]

This Court there said that under the Act,

> "Federal jurisdiction was to follow the flow of electrical energy, an engineering and scientific, rather than a legalistic or governmental test." 324 U.S. at 529.

Applying the *Connecticut* case to the evidence offered by the Commission in this case the court below in the present case could find no basis for supporting the conclusion that FPL was a "public utility."

In the first jurisdictional case of this Court based on sales at wholesale, *Pennsylvania Water & Power Co.* v. *FPC*, 343 U.S. 414 (1952), the company did not dispute that electric energy flowed back and forth across the Pennsylvania-Maryland state line, nor that some of its sales at wholesale in both states were made with such energy. The company denied that its "sales to its Pennsylvania customers can be considered sales in interstate commerce because each in-

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[19] App. 272.

[20] *Connecticut Light & Power Co.* v. *FPC*, 141 F.2d 14, 18 (D.C. Ct. App. 1944).

cludes varying amounts of energy which does not cross the state line."[21]

This Court held that because the wholesale customers received at least some out-of-state energy, those sales were subject to the jurisdiction of the Commission.

Jurisdiction of the Commission under Part II of the Act was most recently reviewed by this Court in the *City of Colton* case, *Federal Power Commission* v. *Southern California Edison Co.*, 376 U.S. 205 (1964). In that case, substantial quantities of power generated in Nevada and Arizona were sold to Edison, and transported into California. The Commission traced this energy through Edison's Hayfield and Highgrove Substations, the latter of which supplied all the requirements of the City of Colton. Edison was already being regulated as a "public utility" by the Commission, and the only question was jurisdictional status of this sale. The Court of Appeals assumed the sufficiency of evidence of interstate energy being used in making the sale to the City of Colton at wholesale, but denied the Commission's jurisdiction over that sale because there was no substantial interstate effect.

In this context this Court declared that there was substantial evidence of interstate energy flowing to the City of Colton and that the Congressional intent was for *all* sales at wholesale of interstate energy to be subject to Commission jurisdiction, regardless of the degree of impact on interstate commerce. 376 U.S. at 215-216.

The very same method of tracing relied upon by the Commission and this Court to establish the flow of interstate energy to the City of Colton, when applied to FPL, Corp and Georgia conclusively shows that no interstate energy was transmitted over FPL's facilities.

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[21] *Pennsylvania Water & Power Co.*, 8 F.P.C. 1, 12 (1949).

Rather than the foregoing cases, the Commission attempts to rely upon the methodology of Court of Appeals decisions, the "power pool" cases. *Indiana & Michigan Electric Co.* v. *FPC*, 365 F.2d 180 (7th Cir.), cert. denied, 385 U.S. 972 (1966); *Arkansas Power & Light Co.* v. *FPC*, 368 F.2d 376 (8th Cir. 1966); *Public Service Co. of Indiana* v. *FPC*, 375 F.2d 100 (7th Cir.), cert. denied, 387 U.S. 931 (1967); and *Cincinnati Gas & Electric Co.* v. *FPC*, 376 F.2d 506 (6th Cir.), cert. denied, 389 U.S. 842 (1967).

Each of the companies involved in the above cases was an admitted "public utility" within the meaning of the Act. Each made numerous jurisdictional sales at wholesale. The only question in each case was whether other, particular sales were also subject to Commission regulation. The court in each case held such sales were jurisdictional.

In *Indiana & Michigan*, no tracing studies were offered, but the Commission did show that such large amounts of interstate energy were present at numerous locations throughout the utility's system that the only reasonable conclusion was that such energy at least on some occasions was used in making the sales in question.[22] In *Arkansas*[23] and *Public Service*[24] tracing studies that were made confirmed the high degree of probability of interstate energy going to *all* sales. In *Cincinnati Gas & Electric* the court's opinion does not refer to tracing, but in a Commissioner's concurring opinion, it is noted that the staff presented a comprehensive tracing study which showed that out-of-state energy reached every point of resale.[25]

In any event there was no tracing testimony to rebut any inference that interstate energy was transmitted in

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[22] 365 F.2d at 182, 183.
[23] 368 F.2d at 380.
[24] 375 F.2d at 104, fn. 8.
[25] *Cincinnati Gas & Electric Co.*, 35 F.P.C. 99, 104 (1966).

each sale. In each of these cases, jurisdiction over those sales was established under the facts. It cannot be said that these cases or any of them laid down a general principle that jurisdiction over all sales at wholesale would be proved simply by showing that the public utility in question received some interstate electric energy.

The court below pointed out in great detail the inapplicability of these cases to the FPL situation.[26] Here there is no justification for the Commission to make the *inference* that FPL is a "public utility," where the evidence of tracing shows no actual transmissions of interstate energy over any facilities of FPL, and therefore completely rebuts any inference which might otherwise be made based on the Corp-Georgia Power connection.

III. THE ELECTROMAGENTIC UNITY THEORY IS NOT EQUIVALENT TO INTERSTATE TRANSMISSION AND IS NOT SUBSTANTIAL EVIDENCE THEREOF

The Commission argues that interconnection between companies (such as all those in the ISG) produces a certain phenomenon, which it labels "electromagnetic unity of response", that such a phenomenon involves a cause in one state and an effect in another, and therefore the "theory of electromagnetic unity of response" *is* "transmission of electric energy in interstate commerce."

This approach is contrary to the existing standards heretofore applied.

First and foremost, the Commission's theory is not compatible with the statute. Congress defined interstate transmission as follows:

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[26] App. 368-371, as reproduced in Exhibit "A" hereto.

> "[E]lectric energy shall be held to be transmitted in interstate commerce if transmitted from a State and consumed at any point outside thereof." Section 201(c), 17 U.S.C. § 824(c).

In its previous encounters with the jurisdictional status of companies under this statute, this Court has in every case looked to proof of *actual* transmissions. *Jersey Central,* 319 U.S. at 64-67; *Connecticut Light & Power Co.,* 324 U.S. at 518-521; *Penn-Water,* 343 U.S. at 419-420; and *City of Colton,* 376 U.S. at 208-209.[27]

As pointed out above, "electromagnetic unity" is a cause-and-effect phenomenon related to interconnection; it does not mean that transmission takes place between the location of a cause (a light being turned on in Georgia) and the location of a possible effect (FPL generator site). Nothing in this phenomenon would give an "engineering and scientific" basis for inferring interstate transmission of electric energy.[28]

The Commission speaks broadly about the Interconnected Systems Group (ISG). However, the record does not offer much beyond the cause-and-effect relationship resulting from synchronism. In terms of the validity of the theory of "electromagnetic unity" as a substitute for actual transmission, the ISG is irrelevant. The simple fact of Corp's

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[27] Reference is made to the Court of Appeals decision in each case for further facts showing measurement of actual transmissions of electric energy in interstate commerce.

[28] The Commission in its brief, page 25, says there must be some sort of "signal" being "transmitted" when a generator in one state alters its mode of operation by reason of the addition of a load in another state. The Commission does not give record reference for this statement, which is understandable, since we know of no testimony about any such "signal" or that if it exists it constitutes the transmission of *electric energy.* The only "signal" involved is the response of the generator to the load it supplies, and all the generators of FPL supply only loads in Florida.

connections with both Georgia Power and FPL either establishes jurisdiction or, as FPL contends, it is insufficient to do so.

The record is clear that by interconnecting with Corp which is in the ISG, FPL is not thereby a part of an "integrated, interstate pool operation",[29] nor can its actual status be stretched by such words as "interdependent with and upon the ISG." FPL is basically autonomous and independent in generating enough electric energy to meet all its own loads. The "substantial benefits" claimed by the Commission[30] to accrue to FPL with membership in the ISG are substantially hypothetical.

The Commission says FPL "receives automatic assistance during emergencies, including assistance from the non-Florida ISG utilities up to the 100 megawatt capacity of the Corp-Georgia [Power] tie line".[31] This gives the completely erroneous impression that FPL *in fact* receives or has received any electric energy from the ISG. The record does not disclose any instance when FPL has ever received electric energy — emergency or otherwise — from any company outside the State of Florida.

The Commission's brief (p. 7) suggests that because of its membership in the ISG, FPL *transmitted* 8 megawatts of electric energy to a Midwestern utility when the latter suffered a loss of generation on February 17, 1965. The staff did not attempt to trace this electric energy out of state, and a witness who testified about this stated unequivocally that FPL simply had a *scheduled* net interchange with members of the Florida Operating Committee of 8 megawatts immediately following the outage in the Midwest and "by no stretch of anyone's imagination, could [the 8 megawatts] be considered to have crossed the state line let alone travel all the way to the Midwest."[32]

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[29] *Arkansas Power & Light*, supra, 368 F.2d at 379.
[30] Comm. Brief, pp. 11, 26, 30.
[31] Comm. Brief, p. 11.
[32] App. 73, 75.

The existence of the ISG, the connection of FPL to Corp, and the connection of Corp to Georgia Power makes possible energy transmissions different from those which are now occurring or which have occurred. But the mere possibility that FPL might change its operations at some future time to transmit or receive out-of-state energy over its facilities cannot be the basis for the Commission to assert its jurisdiction at the present time. The Commission's jurisdiction must be based on actual interstate transmissions, not the possibility of future interstate transmissions.

As a theory of jurisdiction, "electromagnetic unity" is a construct applied for the first time in this case. None of the Supreme Court cases above use the term, nor do the power pool cases. The latter merely mention the fact that generators within the pool are "interlocked electromagnetically,"[33] or that "frequency control" of generators is involved,[34] or that the power pool members operate "in synchronism,"[35] but jurisdiction was not found to attach simply because of any such thing as "electromagnetic unity."

The Commission admits "FPL's participation in the Florida Operating Committee and the ISG lacks the scope of the pooling arrangements" in the power pool cases.[36]

In the *Jersey Central* case, the Commission attempted to make something out of the fact that Jersey Central was interconnected and "synchronized" not only with two other New Jersey companies but also "other electrical transmission systems covering the southern part of New Jersey, the southeastern part of Pennsylvania, the northeastern

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[33] *Indiana & Michigan*, supra, 365 F.2d at 183.
[34] *Arkansas Power & Light*, supra, 368 F.2d at 378.
[35] *Cincinnati Gas & Electric*, supra, 376 F.2d at 507.
[36] Comm. Brief, p. 30.

part of Maryland, Delaware and with the Staten Island Company . . ." To this, the Third Circuit responded:

> "Though much emphasis is laid by some of the Commission's witnesses on the phenomenon of synchronization, it does not possess significance under the facts of the appeals at bar except to the extent indicated in the opinion."[37]

On appeal, this Court had before it the same evidence when it affirmed the Third Circuit and said, "Mere connection determines nothing."

Thus, what the Commission now calls a new "theory" of interstate transmission is the same thing urged and rejected in 1943. The same technology with respect to this fact existed then as now. No reason appears why *Jersey Central* should be overruled or why the definition of what constitutes interstate transmission should be changed for the sole purpose of bringing FPL for the first time in 36 years under Commission jurisdiction.

The Commission's plea that it should be allowed to apply its own "scientific" definition of *transmission of electric energy*,[38] is a bald attempt to put itself beyond the restraining guidance of judicial review. Similarly, its argument about the impracticability of tracing in this case, citing the power pool cases,[39] is tantamount to confessing inability to *prove* interstate transmission.

By urging the many unexplained characteristics of electricity, the Commission is asking for the right to determine its jurisdiction over electric companies wholly outside the limits established by Congress in Section 201 of the Federal Power Act.

Similarly, the Commission's argument from the *City of Colton*[40] case points up the extent to which its claim of

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[37] 129 F.2d at 187
[38] Comm. Brief, p. 37.
[39] Comm. Brief, p. 28.
[40] Ibid. p. 31.

jurisdiction over FPL is beyond that statute. The "bright line" said by this Court to have been drawn by Congress between state and federal jurisdiction over sales at wholesale[41] has no application to the matter of *determining whether or not there has been interstate commerce.*

Assuming interstate transmission, there is no distinction made between those sales at wholesale which have substantial impact on interstate commerce and those which do not. The Commission has no discretion to decline to exercise jurisdiction over those in the later category. This was the holding in *City of Colton*. Nothing was said to indicate that the interstate character of transmissions could be established by any generality such as "interconnection" or "electromagnetic unity."

Indeed, this Court there recognized the differences between a case where interstate transmission was admitted, and one where this was yet to be established, pointing out that the Commission had initial discretion to decline jurisdiction altogether over a company whose interstate transmissions, if any, were *de minimis*, particularly where no jurisdictional sales at wholesale were involved.[42]

As discussed above, the *City of Colton* case established interstate transmissions by the same method stated by the Examiner to show no interstate transmissions in this case.[43] The standard of proof in that case as well as in *Jersey Central* was *actual* transmissions. The same standard should apply here.

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[41] 376 U.S. 215-216.

[42] 376 U.S. at 209, n. 5.

[43] App. 272.

IV. THE TRACING STUDY SUBMITTED BY THE COMMISSION DOES NOT ESTABLISH BY SUBSTANTIAL EVIDENCE INTERSTATE TRANSMISSION FROM OR TO FPL

The Commission suggests that there are three kinds of situations with three rules to be followed in ascertaining jurisdictional transmissions: the *Jersey Central* case, where "the task of tracing has been simple due to the limited number of interconnections involved," the power pool cases where no tracing is practicable, and then a middle category where tracing is "possible" but so involved that a different method must be used.[44]

The Commission says this case falls in the latter category — even though like *Jersey Central,* we are concerned with only one place of connection between FPL and Corp.

The Commission's idea of a different method is simply one that produces the desired result. It is an overstatement to say that this Court approved the "commingled-in-a-bus" theory in the *Penn-Water* case. Nowhere in the Commission or court opinions is the crucial point stated or particularly relied upon that a bus may be treated as a point or a tank or a reservoir. As evident from the discussion of this case above, page 17, the *Jersey Central* method of tracing would undoubtedly have produced the same result.

Similarly, in the other case cited in support of the "commingled-in-a-bus" theory, *Wisconsin-Michigan Power Co.* v. *Federal Power Commission,* 197 F.2d 472 (7th Cir. 1952), cert. denied, 345 U.S. 934 (1953), the presence of Wisconsin energy in the company's Michigan lines, and Michigan energy in that same company's Wisconsin lines was not disputed. Jurisdiction over the sales for resale was contested on grounds other than the correctness of the tracing of interstate electric energy.

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[44] Comm. Brief, p. 32.

This appears to be the first case where the "commingled-in-a-bus" theory produces a different result from the standard method of tracing. There is nothing in the record to indicate that the Commission would not have been perfectly satisfied to use the standard method had it supported a finding that FPL is a jurisdictional "public utility." As the Examiner stated,[45] this standard method proves the contrary—no out-of-state energy was transmitted over FPL's lines during the periods studied.

The Commission calls the "commingled-in-a-bus" theory a refinement,[46] while the dissenting Commissioners point out that this is just a theory, and that its underlying assumptions really beg the question of jurisdictional transmission, obviating the necessity for tracing actual transmissions.[47] The Examiner acknowledged it was only a theory—it has never been proved experimentally as a fact[48] —but concluded it more accurately represents the facts to treat "the bus as a point, a tank or a reservoir."[49]

FPL challenges this assumption of accuracy. The commingled theory assumes the 225-foot Turner bus to be a point, which it is not; or assumes that there can be a tank or reservoir of electricity, which is an impossibility since electricity cannot be stored. The Commission's expert witness admits that his commingled theory does not take into consideration "the physical dimensions, mechanical properties and electrical properties" of a bus.[50] The Commission's theory is thus a legalistic rather than an engineering or scientific one, and the use of such legalistic tests in determining electrical flow was condemned by this Court in

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[45] App. 272.
[46] Comm. Brief, pp. 32-33.
[47] App. 303-304.
[48] App. 95.
[49] App. 274.
[50] App. 164.

Connecticut Light and Power Co. v. *FPC*, 324 U.S. 515 at 529.[51]

It is the ignoring of the physical reality of the Turner bus to which FPL objects. FPL acknowledges that there can be "commingling" of electric energy where the location and connection of generators produces a mixed flow of electric energy in one direction to the load.[52]

However, in order for there to be "commingling" of electric energy within the bus under all circumstances, one must disregard the location of connections along the bus, and the inputs and outflows through those connections and one must postulate a "filling of the tank," with a swirling ebb and flow of electric energy, analagous to the random mixing of molecules of natural gas within a pipeline.

We submit that the Commission's *purpose* for using the "bus-as-a-point" theory is to establish jurisdiction. Its stated *reason* for using such theory was previously given the *coup de grace* by the Commission itself (with judicial approval) in the Commission's decision in the *Connecticut* case.[53] Now the Commission seeks to use that which it completely discredited nearly thirty years ago. We submit it was a wrong theory then, and it is still wrong.

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[51] Just as jurisdiction cannot depend on the ingenuity of attorneys in drafting natural gas contracts which ignore the reality of gas flowing in interstate commerce, *Federal Power Commission* v. *Lo-Vaca Gathering Co.*, 379 U.S. 366 (1964), so jurisdiction here should not depend on the ingenuity of Commission staff experts in devising theories of electric flows which also ignore realities.

[52] This apparently is the way the term "commingling" is used in the "power pool" cases, discussed above (pp. 25-26) where it was used to describe the electric energy in a company's system *after* it has been shown that substantial amounts of interstate energy were transmitted at several places into that company's lines, the "commingling" being with energy from the company's own generators.

[53] *Connecticut Light & Power Co.*, 3 F.P.C. 132 (1942).

The Commission, through its expert, says that it treats a bus as a point because in an alternating current flow (whether it be three-phase or not) there is a small portion of each fraction of a second during which "power" in each phase flows back from the load to the generator. (App. 146, 147, 154, 155). He says that while watt-hour meters may be adequate for most business and operating purposes, they are not adequate here because they do not show the relatively small negative (or reverse) "power" portion of the cycle separately from the positive "power" portion of the cycle. (App. 147, 151, 153, 167-169). The knowledge of the existence of these negative "power" pulses is not new. They were well known before the *Connecticut* case (R. 767-769). As will be shown later herein, *these negative "power" pulses are not electric energy.* But regardless of that, the Commission in the *Connecticut* case rejected an expert witness's theory that "over and above the flow of electric energy on a circuit shown by watt and watt-hour meters there may be postulated other flows and counterflows not shown by the meters," stating that such a theory,

> ". . . is wholly suppositious and not supported by the commercial practice of the electric utility industry. That practice is to accept such meter readings as showing the direction in which electric power or energy is supplied, and the total amount supplied as a basis of payment for energy bought and sold in the countless transactions upon which the industry's revenues depend."[54]

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[54] 3 F.P.C. at 145. Yet in the present case the Commission's witness said: "One way would be to have counter-flows, to show areas of power flow in both directions from each generator, or to treat the — to collapse the bus as a point or call it a tank or a reservoir, so you don't have to concern yourself with the intricacies of what happens on the bus itself. . . . The commingling method accounts for [what happens on the bus] in the form of a basket. In other words, it is all-inclusive; you don't care what happens between the points." App. 150-151.

The Court of Appeals affirmed the Commission and on this point stated:

> "... A distinction between electric current as measured on a meter and electric energy was certainly not within the contemplation of Congress when it passed the Act; indeed, no scientist knows what the nature of electric energy is. Ordinarily meter readings which measure electric current are sufficient data on which to make charges for electricity to users. That they are equally sufficient to determine the interstate transmission of energy under the Federal Power Act is shown by the case of Jersey Central Power & Light Co. v. Federal Power Commission, 1943, 319 U. S. 61, 63 S.Ct. 953, 87 L.Ed. 1258."[55]

On appeal to this Court, the dissent noted that the interstate transmission of electric energy was undisputed.

We submit that the Commission and the Court of Appeals in the *Connecticut* case were correct with respect to flows of electric energy.

The proposition that any one cycle of "power" includes a small portion of a negative or reverse "power" is misleading. The "power" that is supposed to be reversing is not electric energy. (This may be why the concept of reverse flow was rejected in the *Connecticut* case.)

The "power" diagrams used by the Commision's expert in an attempt to establish a small reverse flow of "power" are diagrams of *apparent* power.[56] Apparent power is composed of both *real* power and *reactive* power. Reactive power is that portion of apparent power that *does no work*,

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[55] *Connecticut Light & Power Co.* v. *FPC*, 141 F.2d 14, 17 (D.C. Cir. 1944).

[56] Ex. 58, App. 240; Ex. 59, R. 1252; Ex. 60, R. 1253.

it is not measured in kilowatts but is measured in kilovars, and it is the part of the apparent power curve that shows up as a negative pulse. It is not electric energy as it does no work. However, *real* power is the work-producing part of apparent power and is measured in kilowatts. That is, real power is that part of apparent power which is the electric energy at any one instant.[57]

Real power, that is, instantaneous *electric energy, never has a reverse pulse* and this is admitted by the Commission's expert (App. 174).

The Commission has phrased the question before this Court solely in terms of the interconnection establishing jurisdiction *per se* under the electromagnetic unity theory.[58] Thus, the Commission plainly recognizes its attempt at tracing as a subordinate effort, or as the Commission witness put it, "a rough approximation."[59]

The Commission's brief urges that "the tracing of power flows is an unnecessary and inefficient procedure for deter-

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[57] The terms "apparent power", "reactive power" and "real power", are defined as follows:

"*APPARENT* Apparent power is proportional to the mathematical product of the volts and amperes of a circuit. This product generally is divided by 1,000 and designated in kilovoltamperes (kVA). It is comprised of both real and reactive power."

"*REACTIVE* The portion of 'Apparent Power' *that does no work*. It is commercially measured in kilovars. Reactive power must be supplied to most types of magnetic equipment, such as motors. It is supplied by generators or by electrostatic equipment, such as capacitors."

"*REAL This is the energy or work-producing part of 'Apparent Power.'* It is the rate of supply of energy, measured commercially in kilowatts. *The product of real power and length of time is energy,* measured by watthour meters and expressed in kilowatthours."

Glossary of Electric Utility Terms prepared by the Statistical Committee of the Edison Electric Institute, pp. 62, 63. See footnote 2.

[58] Comm. Brief, p. 2.

[59] App. 49.

mining Commission jurisdiction."[60] But it has never before rejected this universally applied method of determining jurisdiction over a company.

The Commission's "commingled-in-a-bus" theory did not in this case establish substantial evidence of the interstate flow of electric energy, or as the court below put it, the Commission does not meet its burden of proof,

> " . . . by postulating a simplified characterization of how, for various purposes of convenience, energy may be treated as flowing."

The Commission attacks this holding of the court, saying, "the court of appeals has improperly acted on the basis of its own inexpert views."[61]

This appeal seems to be made whenever an administrative agency is reversed. But the court of appeals is required to review both the standard of proof used and the substantial evidence offered. *Federal Power Commission* v. *Sierra Pacific Power Co.*, 350 U.S. 348, 354 (1956).

The court below found the theories and methods used by the Commission did not accord with the standard required by the statute: actual transmission of electric energy in interstate commerce. Where the statutory requirements for establishing the jurisdictional facts were so clearly ignored by the Commission, it cannot expect to be able to hide behind the complexity of the subject or a claim of immunity to investigation of their "expertise."

In analyzing and reviewing the cause in this manner, the court correctly concluded that the statute had not been applied by the Commission to FPL, in the words of *Gray* v.

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[60] Comm Brief, p. 3..

[61] Comm. Brief, p. 37.

Powell, 314 U.S. 402, 411 (1941)[62] "in a just and reasonable manner." Under these circumstances the court was not bound to accept without question the Commission's interpretation of the statute nor the application thereof to the facts of the case. *Volkswagenwerk Aktiengesellschaft* v. *Federal Maritime Commission,* 390 U.S. 261, 272 (1968). This is particularly true where the action taken is so contrary to the principles of prior cases.

Having determined under the evidence as tested by the statute and applicable cases that there is no substantial evidence upon which FPL could be declared to be a "public utility," the court of appeals is entitled to have its decision stand, where, as here, there has been no misapprehension or gross misunderstanding of the evidence. *Universal Camera Corporation* v. *National Labor Relations Board,* 340 U.S. 474, 490-491 (1951).

V. NO REASONS OF PUBLIC IMPORTANCE REQUIRE COMMISSION REGULATION OF FPL

The legislative history of the statute in question is detailed in the *Jersey Central* and *Connecticut* cases. The conclusion is stated in the former case that the primary purpose of Part II of the Federal Power Act

> ". . . was to give a federal agency power to regulate the *sale* of electric energy across state lines."[63]

The Court quoted from *Jersey Central* in *Connecticut:*

> "The purpose of this act was primarily to regulate the rates and charges of the interstate energy. If intervening companies might purchase from producers in the state of production, free of federal control, cost

[62] Cited on this point by the Commission in its brief, p. 37.
[63] 319 U.S. at 67.

would be fixed prior to the incidence of federal regulation and federal rate control would be substantially impaired, if not rendered futile."[64]

FPL does not dispute that interstate *transmission* is made an independent basis for Commission jurisdiction, but clearly it is interstate *sales at wholesale* that is the primary concern, and regulation of interstate transmissions is incidental to and in support of regulation of wholesale rates.

Under these circumstances, where FPL has only six small sales at wholesale, and no evidence was offered that these might be jurisdictional sales, even assuming FPL be declared a "public utility" under the Act, there is slight reason to compel Federal regulation of FPL's facilities based on alleged transmissions that would admittedly be insignificant even under the Commission's theory of the case.

As pointed out previously, FPL is uniquely situated in the peninsula of Florida. Requiring the Commission to adhere to the *Jersey Central* standard in this case will not improperly limit the Commission in the performance of its regulatory duties elsewhere in the country.

The Commission is asking in effect that it be allowed to regulate any electric company which *affects* interstate commerce. This may be a proper objective in the public interest, but Congress has yet to declare it so. If the Commission thinks it needs its jurisdiction expanded over all electric energy in this country, let it plead its case to Congress, not this Court.[65]

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[64] 324 U.S. at 524.

[65] On this subject this Court said in the *Connecticut* case: "Such a broad and undivided base for jurisdiction of the Power Commission ["affecting" interstate commerce] would be quite unobjectionable and perhaps highly salutary if the United States were a unitary government and the only conflicting interests to

Because the court below found there was no substantial evidence of interstate transmissions, it did not directly pass upon FPL's point that if all assumptions of the Commission were accepted, and there was some basis for Commission jurisdiction, nevertheless it was an abuse of discretion for the Commission to fail to decline to exercise that jurisdiction.[66]

The *Connecticut* case as well as the *City of Colton* case recognizes that in straight transmission cases the Commission has discretion to decline to exercise its jurisdiction.[67] In the *Connecticut* case the interstate energy in question was one-fifth of 1% of all the energy generated and received.[68] In the present case, if we assume arguendo that the Commission's tracing theory is correct, still the interstate energy would be only 0.07% of all the energy received by FPL from Corp, and only 0.00015% of the energy delivered by FPL to its consumers.[69]

The *City of Colton* case, citing the *Connecticut* opinion, agrees that the fact that any out-of-state energy would be *de minimis* was relevant on the question of whether a particular company was a "public utility" over which the Commission in its discretion should assume jurisdiction.

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be considered were those of the regulated company. But state lines and boundaries cut across and subdivide what scientifically or economically viewed may be a single enterprise. Congress is acutely aware of the existence and vitality of these state governments. It sometimes is moved to respect state rights and local institutions even when some degree of efficiency of a federal plan is thereby sacrificed." 324 U.S. at 530.

[66] The court below did take notice of a disturbing factor: "[T]he implication by the majority of the Commission in the present case that they may be of the view that if the Commission has jurisdiction it cannot in the exercise of discretion decline to exercise it." App. 373.

[67] 324 U.S. at 535; 376 U.S. at 209.

[68] 324 U.S. at 536.

[69] App. 89.

Where jurisdiction derives from this *de minimis* amount of assumed out-of-state energy, and where there is no evidence that would indicate FPL's six sales for resale might be shown to be made with interstate energy, the imposition of the financial burdens of regulation,[70] which will in all likelihood never be transformed into Commission-set rates, is a high price for FPL's customers to pay for some vague "benefits" never clearly defined in the record.

When this Court reversed the Commission's finding of jurisdiction over Connecticut Light & Power Co., it took note of the business of that company as follows:

> "[T]he predominant characteristic of the company's over-all operation is that of a local and intrastate service. It serves one hundred seven towns, cities, and boroughs of Connecticut with a total population of about 660,000, and in addition supplies substantially all the power used by local companies which serve communities of Connecticut having a population of 130,000. It owns no lines crossing the Connecticut boundary and does not conect with any other company at the boundary. It has no business other than Connecticut service for which it needs any facilities whatever, and if local distribution service were terminated, no remaining purpose or use of any kind is suggested for the facilities in question. Its purchases and sales, its receipts and deliveries of power, are all within the state. Its rates and its fiscal and accounting affairs are fully and so far as appears effectively regulated by the State of Connecticut."[71]

On remand the Commission agreed that Connecticut Light

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[70] Changing from FPL's present accounting system, which is in accordance with the system of accounts of National Association of Railroad and Utility Commissioners as prescribed by the Florida Public Service Commission, to the FPC's Uniform System of Accounts will mean incurring substantial clerical and accounting expense.

[71] 324 U.S. at 521-522.

& Power should not be required to change its system of accounts or be otherwise subject to regulation.[72]

The foregoing quotation could well apply to FPL (except for the even small number of sales for resale made by FPL).

For the foregoing reasons FPL submits that it is not subject to Commission regulation, nor should it be.

[72] *Connecticut Light & Power Company*, 6 F.P.C. 104 (1947).

CONCLUSION

WHEREFORE PREMISES CONSIDERED, the judgment of the Court of Appeals should be affirmed.

Respectfully submitted,

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PROOF OF SERVICE

Service of this Brief for the Respondent Florida Power & Light Company has been made upon the Federal Power Commission by mailing copies hereof airmail postage prepaid to Mr. Erwin N. Griswold, Solicitor General, Department of Justice, Washington, D. C. 20530 this .... day of July, 1971

.....
Attorney for Respondent

In the United States Court of Appeals for the Fifth Circuit

No. 24956

FLORIDA POWER & LIGHT COMPANY, PETITIONER

v.

FEDERAL POWER COMMISSION, RESPONDENT.

PETITION TO REVIEW AND SET ASIDE OPINION AND ORDERS OF THE FEDERAL POWER COMMISSION (FLORIDA CASE)

(July 13, 1970)

Before BELL, AINSWORTH and GODBOLD, *Circuit Judges.*

GODBOLD, *Circuit Judge:* Florida Power & Light Company (FPL) petitions for review of a determination,[1] reached by the Federal Power Commission on a 3–2 vote, that it is a public utility within the meaning of § 201 of the Federal Power Act, 16 U.S.C. § 824(e). We reverse the Commission and set aside its order.

The term "public utility" means "any person who owns or operates facilities subject to the jurisdiction of the Commission under sections 824–824h of this

[1] 37 F.P.C. 544.

title." 16 U.S.C. § 824(e). "The provisions of sections 824–824h of this title shall apply to the transmission of electric energy in interstate commerce and to the sale of electric energy at wholesale in interstate commerce * * * The Commission shall have jurisdiction over all facilities for such transmission or sale of electric energy." 16 U.S.C. § 824(b).

The Commission asserts jurisdiction on the ground that FPL owns and operates facilities for the transmission of electric energy in interstate commerce. Jurisdiction over interstate wholesale sales under § 824(b) is not involved.

1. BACKGROUND

FPL's facilities are located wholly within the State of Florida. It has no connections at the state line with any out of state system. Commission jurisdiction is predicated on transmission interstate of FPL-generated power through its interconnection with other electric systems outside of and within Florida, and receipt by FPL, through these interconnections, of power generated outside of Florida.

Congress exercised its power under the Commerce Clause and undertook federal regulation in the interstate electric field as a result of the decision of the Supreme Court in *Public Utilities Commission of Rhode Island v. Attleboro Steam & Electric Co.*, 273 U.S. 83, 71 L.Ed. 549 (1927), holding that neither Massachusetts nor Rhode Island had power to regulate the sale by a Rhode Island utility of electric energy to a Massachusetts utility because the sale was in interstate commerce. There being at that time no federal regulation of interstate sales by electric utilities, Congress acted to close this gap in effective

utility regulation, the "Attleboro gap," by enacting Part II of the Federal Power Act in 1935.

Jurisdiction of the FPC is not based upon a test of effect on interstate commerce but upon interstate transmission of electric energy (or wholesale sales in interstate commerce, not here applicable). 16 U.S.C. § 824(b). To make clear that Commission jurisdiction extends only to transmission or sales "in interstate commerce," the Congress wrote several specific exclusions into the Act.

> * * * such Federal regulation, however, to extend only to those matters which are not subject to regulation by the States.

16 U.S.C. § 824(a). This caveat and the directive that the Act.

> shall not apply to any other sale of electric energy or deprive a State or State commission of its lawful authority now exercised over the exportation of hydro-electric energy which is transmitted across a State line * * *,

16 U.S.C. § 824(b), extend Commission jurisdiction to the limits of but no further than the Attleboro gap. *Connecticut Light & Power Co.* v. *FPC,* 324 U.S. 515 89 L.Ed. 1150 (1945); *Jersey Central Power & Light Co. v. FPC,* 319 U.S. 61, 87 L.Ed. 1258 (1943).

> Likewise, the Commission shall not have jurisdiction, except as specifically provided * * * over facilities used for the generation of electric energy or over facilities used in local distribution or only for the transmission of electric energy in intrastate commerce, or over facilities for the transmission of electric energy consumed wholly by the transmitter.

16 U.S.C. § 824(b). Exemptions are also provided for governmental units and corporations, 16 U.S.C. § 824

(f), for one engaged in transmission or sale of electric energy but not otherwise subject to the Act who makes a temporary emergency connection with a public utility subject to the jurisdiction of the Commission, 16 U.S.C. § 824a(d), and for certain international exports, 16 U.S.C. § 824a(f).

Congress defined interstate transmission as follows:

> [E]lectric energy shall be held to be transmitted in interstate commerce if transmitted from a State and consumed at any point outside thereof.

16 U.S.C. § 824(c). The Supreme Court has credited the Congress with determining that "federal jurisdiction was to follow the flow of electric energy, an engineering and scientific rather than a legalistic or governmental test." *Connecticut Light & Power Co. v. FPC, supra.* Commission power does not extend over all connecting transmission facilities but only those which transmit energy actually moving in interstate commerce. Mere connection determines nothing. *Jersey Central Power & Light Co. v. FPC,* supra, at 72, 87 L.Ed. at 1269.

The concept of following the flow of electric energy from one state to the other was easy to apply in *Attleboro.* A Rhode Island electric company delivered energy over its Rhode Island transmission lines to the facilities of a Massachusetts electric company which had no generating capacity. Now generating companies are interconnected with each other nationwide. Companies have formed area and regional power pools, with varying degrees of integration and centralized management. The Commission itself has power to establish regional districts for voluntary interconnection and coordination of facilities and to promote such interconnection and coordination. 16 U.S.C. § 824a(a).

Interconnection has become a fact of life to meet needs, scheduled and emergency, of localized areas and large regions.[2]

2. THE INSTANT CASE

FPL produces and sells electric energy in eastern and southern Florida. But it is a major electric company.[3]

The Commission opinion describes FPL's interconnections:

> FPL is directly interconnected with four other Florida electric systems, as follows: Florida Power Corporation (Corp), Tampa Electric Company (Tampa), Orlando Utilities Commission (Orlando), and the City of Jacksonville (Jacksonville). FPL, Corp, and Tampa form the Florida Operating Committee (Florida Pool) with Jacksonville and Orlando as associate members. The Florida Pool meets several times a year to consider mutual problems relating to the interconnected operation of the systems, including the coordination of spinning reserves, the arrangement of compatible plant maintenance schedules, and the coordination of plans for the construction of transmission lines and the staggered construction of generating units.
>
> * * * * *

[2] The examiner noted the Northeast power failure of 1965, which plunged large sections of the eastern United States into darkness.

[3] In 1965 it served nearly one million customers, ranked ninth nationally among electric companies in revenues, fourteenth in investment in gross electric utility plant, and sixteenth in kilowatt hour sales. Six of its customers are electric cooperatives, and it occasionally sells to municipal electric systems on an emergency basis. Because of the frequent threat of hurricanes severing its transmission lines, FPL attempts to be self-sufficient, even within different segments of its system.

Corp, which is interconnected with Tampa and Orlando as well as with FPL, is also interconnected with power companies outside of the State of Florida. Thus, it is directly interconnected with Georgia Power Company (Georgia), a subsidiary of The Southern Company (Southern). Southern is a holding company whose other subsidiaries are Gulf Power Company (Gulf) which operates in northwestern Florida, Alabama Power Company (Alabama), and Mississippi Power Company (Mississippi). Corp is also directly interconnected with Gulf, and Gulf is interconnected with Georgia and Alabama. Corp has an agreement with the subsidiaries of Southern whereby Corp makes 100,000 kw available to these subsidiaries during the summer, and in return, the subsidiaries make 100,000 kw available to Corp during the winter. During 1964 Southern delivered 167,476,000 kwh to Corp, and Corp delivered 157,324,000 kwh to Southern. Of these totals, approximately 97,000,000 kwh represented deliveries from Georgia to Corp, and 82,000,000 kwh represented deliveries from Corp to Georgia. In addition, 3.9 million kwh were wheeled for the Southwestern Power Administration over Southern's lines across the Georgia-Florida state line to Corp. Georgia is also interconnected with Duke Power Company, Tennessee Valley Authority, and Southeastern Power Administration. These systems operate in states beyond Georgia.

FPL and the other members of the Florida Pool are also members of a multi-state electric network, the Southeast Region of the Interconnected Systems Group (ISG) which covers the southeastern and central portions of the United States. FPL's membership in the ISG provides acceptable frequency control and also automatic assistance during emergencies in the event of any generation outage of less than

> 100 mw on its system. In this connection it may be noted that 12 of FPL's 24 generating units generate 75 mw or less. An outage of any of these units would lead to almost instantaneous assistance to FPL. FPL, in turn, operates in synchronism with the 140 members of ISG and is ready to assist them in case of emergency. Thus, FPL contributed 8 mw to ISG to assist a midwestern utility which had sustained a 580-mw generator loss.

The Commission position is best explained by quoting from its opinion:

> The testimony and evidence of record support the examiner's findings that the electric power on all the interconnected systems in which FPL, Corp, and Georgia participate is supplied as alternating current at a frequency of 60 cycles; that the frequency of each system is in synchronism with that of all the others in the interconnection; that there is a tie-line bias with frequency control on the interconnected systems which permits a free flow of power and energy throughout the networks in which FPL, Corp, and Georgia participate; that all 140 members of the ISG operate in parallel and are interlocked electromagnetically; and that FPL can receive from or contribute to ISG up to 100 mw. The record further supports the examiner's findings that FPL normally has no control over the actual transfers of electric power and energy with any particular electric system with which it is interconnected; that since electric energy can be delivered virtually instantaneously when needed on a system at a speed of 186,000 miles per second, such energy can be and is transmitted to FPL when needed from out-of-state generators, and in turn can be and is transmitted from FPL to help meet out-of-state demands; and finally, that there is a cause and effect relationship in electric

> energy occurring throughout every generator and point on the FPL, Corp, Georgia, and Southern systems which constitutes interstate transmission of electric energy by, to, and from FPL.
>
> In its exceptions FPL argues that there is no substantial record support for the examiner's finding that it is engaged in the transmission of electric energy in interstate commerce. We find no merit in this argument. The examiner concluded that the operation in FPL in electromagnetic unity with the suppliers in and outside of Florida in and of itself demonstrated that it owned and operated facilities for the interstate transmission of electric energy. This finding is also supported by the evidence produced by staff at the hearing which convincingly establishes that electric energy is transmitted in interstate commerce to and from FPL's lines.

The Commission adopted the examiner's findings. Two are basic. First, that ownership and operation of facilities for interstate transmission was proved by reason of FPL's interconnection with other systems inside and outside of Florida "in electromagnetic unity of response," without any necessity of tracing the path of any interstate electrical energy. Second, that if tracing was considered essential, there had been interstate transmission to and from FPL's lines, based on the Commission's staff studies, which were predicated upon the "commingling theory" of the transmission of electric energy. It is not clear to us whether the examiner and the majority of the Commission considered commingling as undergirding the electromagnetic unity of response theory or as irrelevant to it. The dissenters appeared to treat the two concepts as one, pursuant to which at all times an interconnected network is "permeated" with free flowing electric energy.

The nature and effects of the concept of "electromagnetic unity of response" were described by the examiner approximately as follows. The interconnected systems supply alternating current on the same frequency, 60 cycles per second, with the frequency of each system in synchronism with that of all other systems in the interconnection. The speed of all generators on the interconnected systems is irrevocably locked to the same frequency. A response mechanism known as tie line bias control regulates output in individual systems so that total overall generation matches as closely as possible the total overall load. When at any point a change in load occurs or a generator is taken out of service, this will affect every point on the interconnected systems. For example, every connected generator on the interconnected systems will contribute energy to compensate for any additional load to maintain the balance between total overall generation and total overall load and thereby maintain frequency at 60 cycles. The immediate effects of load or generation changes are dispersed throughout the electromagnetically interlocked generators of the interconnected systems. The magnitude of change in instantaneous generation and frequency will tend to diminish as the distance from the point of load or generation change increases. As such changes occur tie line bias control operates to restore the net interchange of power between each system and its neighbors to the former prearranged level.[4]

[4] The automatic, nonscheduled transfers effected by tie line bias control are not the sole or even the most important transfers among systems. For a variety of reasons, electric companies agree to swap power. Scheduled transfers include seasonal sales, like those between Southern and Corp; other economy sales, made profitable by differences in marginal efficiency among production plants, Indiana and Michigan Electric Co. v. FPC, 365

In our example above, the particular system on which total load increased will automatically increase its own generation to supply the additional load, and the other systems correspondingly will reduce their temporarily increased electric generation. No attempt is made to control flows of electric energy in individual lines (in fact, electric systems normally have no control over actual transfers of energy between them, if there is more than one interconnection), because the flows are determined by the electric characteristics of the overall network. Only the net of flows is controlled, by increasing or decreasing generation so as to maintain scheduled transmissions of power (both within a system and between systems). Thus there is free flow of electric energy throughout the overall network but limited by control of the net of flows, frequency changes, tie line bias, and the responses of generators to load changes.

The examiner stated that nobody can say for certain just how electricity is really transmitted, but that "the answer is not important for legal purposes." He found:

> The cause and effect relationship in electric energy occurring throughout every generator and point on the Georgia, Corp and Florida systems constitutes interstate transmission of electric energy by, to, and from Florida. It is the electromagnetic unity of response of Florida, Corp, Georgia and other interconnecting systems that constitutes the interstate transmission of electric energy by Florida.

F.2d 180 (7th Cir.); *cert. denied*, 385 U.S. 972, 17 L.Ed. 2d 435 (1966); and transfers to compensate for temporary needs such as plant maintenance, as in the Florida Operating Committee arrangements.

We conclude that the complex relationship of cause and effect in interconnected and synchronized systems is, as to FPL, not sufficient to prove the actual transmission of energy interstate. It tells us what, as to that company, could occur. It does not tell us with any substantial degree of certainty what does occur.

This is not to say that "electromagnetic unity of response," with the reasonable inferences which may be drawn therefrom, may not be a part of substantial evidence of interstate transmission, as in the "power pool" cases discussed below. But, standing alone, as to FPL it is not substantial evidence establishing that when energy flows from Corp's lines to Georgia's lines, either scheduled or in response to frequency drop in the state of Georgia or somewhere further distant, the Florida power transmitted is Corp's plus FPL's and not Corp's alone, and conversely that when energy flows from Corp to FPL it is not Corp's alone but mixed with power generated outside Florida.[5] The Commission referred, at the end of the excerpt first above quoted, to FPL's contribution of 8 mw to ISG during an outage in the midwest. That "contribution" does not necessarily mean that power was transmitted interstate from FPL to the midwest. Although the effect of FPL's transmission was to increase the total wattage available to the whole system,

[5] We have focused, as did the examiner and the Commission, on interstate transmission in terms of FPL's interconnection with Corp. But the theory of interconnection and synchronization is applicable to the outermost ends of all interconnected systems. Thus, under this theory a direct interconnection of FPL with Corp is unnecessary because, for example, FPL interconnects with Tampa and Orlando in the Florida Pool, and those two companies are interconnected with Corp, which interconnects to Gulf, which interconnects to Alabama.

the "electromagnetic unity of response" theory is equally compatible with either the Commission's "permeation" assumption or the hypothesis that the power transmitted by FPL was consumed by Corp, another eight mw being passed on by Corp for further use or transmission.

Turning to the second basic finding of energy actually traced, the supporting evidence of actual transmissions referred to by the Commission consists of staff studies purporting to trace energy from Georgia through Corp's substation in Florida into FPL's system, and at other times over the same lines from FPL to Corp to Georgia. These studies are predicated upon the commingling theory, which is simply a method of conceptualizing the complex and not yet fully explainable flow of electric energy. FPL asserted the validity of a different theory, the "systems study method."[6] The difference between this method and the commingling method relied on by the Commission lies in their assumptions about the nature of the transmission bus, a collection and transmission facility for electric power, for example, a substation. The systems study method assumes that it is possible to measure the magnitude and direction of flows within a bus as well as along transmission lines between buses. Relying on this assumption, FPL introduced measurements tending to show that for each point in time at which the Commission attempted to trace power from Georgia to FPL there was in fact a reversal in flow through the bus away from FPL's connection either on the Corp-FPL bus or on some other bus earlier in the trace through Corp's system. Finding on each bus

[6] This is a variation of the so-called steady state method used for accounting and planning purposes in the electric power industry.

the connection which brought power from the direction of Georgia, and totaling the inputs and outflows through other connections on the bus in the direction of FPL's connection, FPL calculated that inputs over this part of the bus were greater than outflows. Under the systems study assumptions, then, power could only flow in the opposite direction through the bus, away from FPL's connection.

The staff did not disprove the correctness *vel non* of these measurements by FPL.[7] Instead the staff urged that the steady state method of describing the flow of three-phase power is inadequate and that the flow is best conceptualized by the commingling theory.

Modern electric utilities generate alternating current electricity. The steady state method treats the flows and counterflows of alternating current as unidirectional and measures only the net of the flows and counterflows. This simply ignores that alternating current is not unidirectional.[8] The commingling concept too treats power flows as only net quantities. But the bus is treated as a "tank" or a "reservoir." The energy flowing to each load on the bus is attributed to each source of energy in the proportion that the source contributes to the total energy flowing into the bus. If at any instant the net flow of power is toward a system—that is, its load is more than its generation—it is assumed that at that moment some portion of the

[7] Counsel for the Commission attempted to do so by a chart, first presented on appeal, which purported to show by the steady state method that interstate power reached FPL. The petitioner did not have a chance to question or controvert in a factual hearing assumptions underlying this chart, so we may not consider it on this appeal.

[8] Staff experts testified that the deficiencies of the steady state method could be corrected by measuring counterflows of energy.

power being consumed by that system flowed into it from every other system contributing to the "tank" or "reservoir" at the bus.[9] Neither the examiner nor the Commission treated the commingling theory as a scientific fact depicting accurately what does occur but only as the more adequate way to conceptualize actual occurrences.[10]

The Commission expert witness Jacobsen acknowledged commingling has never been verified experimentally as fact. The following interchange took place during the hearing before the examiner:

> PRESIDING EXAMINER. I take it the theories are not necessarily right or wrong. How does your theory better explain the facts?
>
> THE WITNESS. [Commission expert]: I think that would be a better question.

In some contexts the commingling method may be a more useful tool for analysis than steady state methods, but this is not to say that it is adequate for all purposes. Both suffer from the same vice of creating a construct which departs from the actual manner in which electricity operates and then attempting to trace the consequences. The engineering and scientific fact test for interstate flow of energy is not met by postu-

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[9] Although we do not rest our decision on this testimony, we note that an expert for FPL calculated that, if it be conceded that commingled power flowed from Georgia to FPL under the Commission's assumptions, the interstate component of the power flowing from Corp into the FPL substation at Sanford, Florida would be only 0.07%, and that as a portion of the energy then being delivered by FPL to its consumers, this interstate energy would amount to only 0.00015%.

[10] Thus the examiner stated:

> "[S]everal explanations may be sufficient [to account for the amount of electric energy at any one point] but none may possess the uniqueness necessary for proof."

lating a simplified characterization of how, for various purposes of convenience, energy may be treated as flowing.

3.

The "engineering and scientific" test based on actual power flow was articulated in *Connecticut Light & Power*. In that case, in the next following words the Supreme Court said:

> Technology of the business is such that if any part of a supply of electric energy comes from outside of a state it is, or may be, present in every connected distribution facility.

324 U.S. at 529, 89 L.Ed. at 1160. We do not construe this language as obviating the necessity for showing interstate transmission of power. In context the Supreme Court was discussing not the technological transmission test but the exception from FPC jurisdiction of "facilities used in local distribution." 16 U.S.C. § 824.

The Commission bears the burden of proving its asserted jurisdiction. *Public Service Co. of Indiana v. FPC,* 375 F.2d 100, 104 (7th Cir.), *cert. denied,* 387 U.S. 931, 18 L.Ed. 2d 992 (1967); *Arkansas Power & Light Co. v. FPC,* 368 F.2d 376 (8th Cir. 1966). In attempting to meet this burden, the Commission does not rely upon the two "straight status" cases that have been adjudicated by the Supreme Court, *Connecticut Light and Power* and *Jersey Central,* neither of which supports its approach in this instance. Instead it turns to the cases in which jurisdiction has been found over wholesale sales "in interstate commerce" and adapts their methodology. *Cincinnati Gas & Elec. Co. v. FPC,* 376 F.2d 506 (6th Cir.), *cert. denied,* 389 U.S. 842, 19 L.Ed. 2d 106 (1967); *Public Serv-*

ice Co. of Indiana v. FPC, supra; Arkansas Power & Light Co. v. FPC, supra; Indiana and Michigan Electric Co. v. FPC, 365 F.2d 180 (7th Cir.), *cert. denied,* 385 U.S. 972, 17 L.Ed. 2d 435 (1966); see also *Pennsylvania Water & Power Co. v. FPC,* 343 U.S. 414, 96 L.Ed. 1042 (1952). *Pennsylvania Water* concerned wholesale sales of an admitted public utility, as defined by the Act, which was part of a system integrated with a Maryland company. During periods of low flow on the Susquehanna River it received substantial amounts of power from the Maryland company, and it was not contested that some interstate energy reached each of its customers.

Each of the four companies in the "power pool" cases from the Sixth, Seventh and Eighth Circuits was likewise a public utility within the meaning of the Act. Each of them also participated in an integrated power pool centrally directed to maximize efficiency by economy transfers and to provide emergency power. CG&E, PSCI and I&M were all members of the American Electric Power System (AEP) spanning several midwestern states, and Arkansas Power & Light was a member of a similar pool operation including utilities in three southern states.

Each of these cases rests on far more than interconnection plus electromagnetic unity of response plus commingling. In both *CG&E* and *Arkansas Power & Light,* limited samples showed that some of the petitioners' wholesale customers received out of state energy. In each case, the company's principal contention was that tracing was necessary to establish the presence of out of state energy in its wholesale transmissions to its remaining customers as well. In each case the utility's membership in a pool, and its consequent regular purchases for economy and other rea-

sons of power generated in other states, justified an inference that not just some but all of its wholesale sales contained interstate energy.

In *I&M* and *PSCI*, the Commission traced no interstate energy to any wholesale customer. In *I&M*, this may have been unnecessary, since there was evidence that for substantial periods of time Illinois energy supplied at least large portions of north central Indiana and southwest Michigan, thereby bringing this case close to *CG&E* and *Arkansas Power & Light*, *PSCI* is the most far-reaching case. But the court in that case rested squarely on *I&M*, finding that the company's participation in the integrated AEP network, in view of the impossibility of tracing, justified the inference that some of the interstate power which demonstrably flowed in PSCI's lines reached each of its wholesale customers.

We agree with the court in *Arkansas Power & Light, supra*, at 383, n.8, that establishing wholesale rate jurisdiction over an electric company which is a public utility within the Act is a different matter from establishing plenary jurisdiction over a company based on interstate transmission. A consideration in the wholesale sale case is the seeming irrationality of allowing Commission jurisdiction over wholesale sales to which experts can trace some out of state energy, but not over those to which it might be impossible to trace interstate power, when it is obvious that there is interstate power in substantial portions of the utility's system. *Cf Arkansas Power & Light, supra.* Another consideration is the seeming irrationality of a public utility with interstate electric energy flowing in its system escaping FPC jurisdiction over wholesale sales because of impossibility of proof arising from the inadequacy of instruments used by the utility itself. *Cf. Indiana & Michigan, supra.* These con-

siderations have little application to the problems of federalism and reservations of power to the states imposed by the instant case, where the issue is one of whether FPL is a public utility at all, measured under tests articulated by the Congress and the courts in terms of actual transmissions of interstate energy.

Some of the wholesale rate cases have relied heavily on the respective companies' participation in an integrated interstate power pool, which provided power more or less continuously, in substantial amounts, and with economy transfers. Neither FP[L] nor Corp is shown to be a member of such a pool.

To the extent that the above wholesale rate decisions purport to rest on a theory of commingling, that theory is nowhere discussed in the context in which it is presented in this case. The term "commingled" appears to have originated in *Pennsylvania Water,* where it was used as a descriptive term for the Court's conclusion that some interstate power must have reached each wholesale customer. None of the subsequent power pool cases gives extended discussion to the scientific ramifications of the Commission's similarly conclusory findings that commingled energy reached each wholesale customer.

The consequences of the Commission's electromagnetic unity theory, with or without the additive of the commingling concept, as a basis for jurisdiction were described by the dissenters in this way:

> The vice I find in the Commission's decision, which prevents me from joining in its statement, is that its adoption of the commingling theory as a test for jurisdiction *per se,* interprets the Federal Power Act to have a reach beyond that which I find in the statute.
>
> The Federal Power Act is today found to grant to the Commission jurisdiction over *any*

company which generates electric energy in the form of alternating three-phase 60-cycle current, if that company is interconnected and electromagnetically synchronized with any other generating source producing electric energy in the same form in another State.

More than 90% of the Nation's electric generating capacity is interconnected in this fashion.[11] The only major exception is the electric generation of Texas, which is interconnected within Texas but not with out-of-Texas systems. Such a test for jurisdiction writes out of the statute the intrastate and industrial exceptions to coverage under the Act, and in doing so objectionably usurps a prerogative of the Congress.[12] (Emphasis in original.)

* * * * *

If commingling obviates tracing, then the reach of the Commission's jurisdiction is plenary. Furthermore, it has become plenary in 1967, while the act was passed in 1935 and has not been changed by Congress (in respects material here) since.

* * * * *

The stated purpose of section 202 was to assure an abundant supply of economical energy by *voluntary* interconnection of facilities. If jurisdiction inexorably follows interconnection, the nonjurisdictional utilities cannot retain any aspect of their independence once they agree

[11] The examiner's description of scope was no less cogent.

"The electric systems of Florida and all other interconnected systems are essentially alike as to electrical, electromagnetic and electromechanical characteristics. Because they are alike, it is possible to have presently existing interconnected operations on a very large scale, extending from the Rocky Mountains to the Atlantic Ocean and from the Canadian to the Mexican border.

[12] The exceptions are set out in part 1 of this opinion.

> to interconnect. Impregnation is indivisible. Such a reading of section 202 is hardly conformable to its general spirit, and is inconsistent with the legislative history, of this part of the Act. (Emphasis in original.)

The qualities of electric energy have long been familiar. If the free flowing character of electricity *vel non* proved interstate transmission then connection, rather than proving nothing, *Jersey Central Power & Light Co. v. FPC, supra,* at 72, 87 L.Ed. 2d at 1269, proves everything, if it is made to any point of the synchronized system that spans most of this country.

The impact of these consequences is pointed up by two other factors: the principle that for determining existence of jurisdiction the quantity of energy transmitted interstate is immaterial,[13] and the implication by the majority of the Commission in the present case that they may be of the view that if the Commission has jurisdiction it cannot in the exercise of discretion decline to exercise it.

To attach federal agency jurisdiction is to supplant[14] or parallel[15] the regulatory schemes of the states. Congress avoided any such entry into the field where the Attleboro gap poses no bar to state regulation.

What the Commission virtually argues for in this case is extension of its jurisdiction to all electric companies affecting interstate commerce. Our society grows increasingly more complex, more dependent

[13] Connecticut Light and Power Co. v. FPC, *supra;* Wisconsin-Michigan Power Co. v. FPC, 197 F.2d 472, 478 (7th Cir.) *cert. denied*, 345 U.S. 934, 97 L.Ed. 1362 (1953).

[14] *E.g.*, in wholesale ratemaking, 16 U.S.C. § 824d.

[15] *E.g.*, in accounting requirements, 16 U.S.C. § 825.

upon electric energy, and the interconnection of electric systems is ever more pervasive. But such an extension of Commission power, if determined to be in the national interest, is for the Congress and not for this court.

The petition for review is *granted* and the order of the Commission is *reversed.*

EXHIBIT B

TURNER BUS

Turner Plant Substation of
Florida Power Corporation (CORP)